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SOCIETY OF ARTS.

FRIDAY, OCTOBER 14th, 1853.

INSTITUTIONS TAKEN INTO UNION.

The following Institutions have been taken into Union since the last announcement:

289. Bury St. Edmunds, Athenæum and Suffolk Institute of Archæology and Natural History.
290. Cambo (near Morpeth), Subscription Library.
291. Odiham, Mechanics' Institution.
292. Clapham, Literary and Scientific Institution.
293. Sheffield, People's College.
294. Tottenham and Edmonton, Literary and Scientific Institution.

INTERCHANGE OF PRIVILEGES.

The following Institutions have requested that their names may be added to the List of those agreeing to the General Interchange of Privileges, by which the Member of any one Institution, when visiting a town in which any other is situated, may enjoy at that other, for the time being, all the advantages of membership, subject, of course, to such conditions and regulations as each Institution may think fit to make. Secretaries of Institutions are particularly requested to correct, from time to time, from the notices which appear in the Journal, the Sheet-Lists of Institutions in Union sent to them a short time back, in which those are particularly marked that had agreed to the interchange:

Bath, Commercial and Literary Institution.
Bodmin, Literary Institution.
Bridgwater, Literary and Scientific Institution.
Camberwell, Institute for the Industrial Classes.
Clapham, Literary and Scientific Institution.
Corfe Castle, Mutual Improvement Society.
Hereford, Philosophical, Antiquarian, and Literary Society.
Leek, Mechanics' Institution.
Shaftesbury, Literary Institution.
Truro, Literary and Scientific Institution.
Whitby, Institute.
Whitehaven, Mechanics' Institution.
Wimborne Minster, Society for the Acquirement of Useful Knowledge.

STATISTICS.

The Circular and List of Queries proposed by the Society of Arts, 25th July last, with a view to obtaining correct information as to the actual condition of the Literary and Scientific Institutions and Mechanics' Institutes of the United Kingdom, have duly been responded to by about one-third of the whole number. Many of those which have been received have evidently been most carefully filled in, and considerable time must have been occupied in procuring the requisite information for the purpose. But unless a large proportion of the remaining two-thirds are returned, it will not be possible to publish a summary of the replies in that form which was at first intended, so as to show not only the actual extent and importance of these Institutions, but also their predominance in particular districts and counties, so as to enable some deductions to be drawn as to their usefulness in promoting and advancing education.

It is earnestly desired that those Institutions which have not yet made any return to the Queries in question, will do so with as little delay as possible, and not later than the 1st of November; and that the secretaries and officers of Institutions will also urge upon others in their several localities, or to whom they may happen to be known, the importance and necessity of making the returns by the time stated.

EXHIBITION OF INVENTIONS.

Members and others, who intend to contribute to the Fifth Annual Exhibition of Inventions, are requested to forward their models, specimens, or drawings, on or before the 1st of November next, in order that they may appear in the Catalogue.

INDUSTRIAL EDUCATION IN INDIA.

Whilst the subject of Industrial Education is exciting so much interest in this country, it is pleasing to find that its importance is recognized in other regions, and that it has been practically taken up with considerable success in Madras. That India presents a field peculiarly adapted for progress in this direction will be evident when we remember the display of her products and manufactures at the Great Exhibition of 1851. The excellence which was there displayed in colouring and design, by the almost instinctive skill of the natives, put to shame the efforts of the more educated artizan of this country; whilst, in many respects, the niceties of manufacture were sadly deficient, showing that if by education we could give a greater knowledge to the native on this head, the manufactures of India need fear comparison with no others in the world. So long ago as 1850, a School of Industry was established by the active exertions of Dr. Alexander Hunter. Soon after his appointment as surgeon, about the 1st of May, 1850, Dr. Hunter, entirely at his own charge, opened a School of Arts, with the liberal and enlightened design of creating among the native population a taste for the Fine Arts. This Institution has became the forerunner of a School of Industry in connection with it. The success which attended the School of Arts very soon suggested to the mind of Dr. Hunter to enlarge his plans by establishing in connection with it the School of Industry, for giving instruction in various branches of the useful Arts. This Institution, like the School of Arts, was originally set on foot by Dr. Hunter, at his own cost; but after a little while, finding himself under the necessity of obtaining some pecuniary help, to provide the necessary apparatus for the operations of the school, he appealed to the public, and so obtained a small contribution in aid of its funds; and at the same time he induced a number of gentlemen to consent to form themselves into a Committee, to assist him in its management. The Madras School of Industry was opened on the 1st of June, 1851, the object of its establishment being to afford to the rising generation of the country the opportunity and means of acquiring useful handicrafts, to improve the manufacture of various articles of domestic and daily use, largely made in the country, but rudely and uncouthly; and also by developing the latent natural resources of the country, to create a local supply of several articles in general demand, which had hitherto been almost entirely imported. A further object was more immediately allied to that of the School of Arts, viz., to improve the taste of the native public, and make them familiar with beauty of form and finish in articles daily in their hands and before their eyes. The result of the experiment has, notwithstanding the short period that has elapsed since the commencement of the school, been such as to afford very encouraging hopes of its success and usefulness.

The Committee, in a Report, dated March, 1852, state, that since the opening of the school, forty-four pupils had been under instruction, and that it then contained nineteen pupils, of whom they reported eighteen to be making creditable progress. The work on which the pupils had been principally employed was pottery. A ready sale appears to have been found for many of the articles manufactured, the orders received being indeed far greater than the school, with its existing appliances, could meet.

The various mineral products of the Presidency have been brought to bear in the manufactures effected; such as porcelain, earths and clays, gypsum, quartz, felspar, granites, steatite, corundum, magnesite, galena, manganese, plumbago, the ores of iron, and coloured earths. These and other products, either brought to light or discovered in new localities, and in greater variety by the same means, are likely to become articles of large and profitable export to England in their raw state, particularly, as the Committee state in their report, fine qualities of emery, and two or three qualities of corundum, chromate of iron, a rich ore of manganese, and another of antimony.

The School of Arts is closely associated with the School of Industry; indeed the two schools are intimately connected, and mutually dependent on each other; the success of the one materially contributing to the success of the other. It appears that the School of Arts opened May 1st, 1850, and the number of pupils who applied for admission was at once considerable, and in three or four months there were about 180 pupils, who willingly paid a rupee a month for instruction. Since then the numbers in Madras have gone on increasing till there was in March, 1852, nearly 300 youths, studying drawing, painting, or engraving in the original school, and in the two branch schools, which it became necessary to open in connection with the Vepery Grammar School and at the Military Male Orphan Asylum. These three schools now support seven East Indian and native masters, on monthly salaries of 70, 50, 30, 25, 10, 8, and 7 rupees; in addition to which a good many of the pupils are earning from 5 to 10 rupees a month by copying pictures, drawings, sketches, and assisting to illustrate periodical literature, for which the school is creating a demand.

The Third Annual Report of the School of Industrial Arts, dated July, 1853, states, that some important changes have taken place during the past year. The school has been entirely remodelled, "so as to adapt the system of instruction to the wants of the different classes of the pupils, who are becoming so numerous that accommodation could not be provided for all in one building." It appears too by the Report that the monthly charge of one rupee was too high; and that East Indian pupils were soon tempted to seek and obtain other employment, and had no difficulty in getting situations as writers. Native pupils appear to be too poor to pay for their instruction and to purchase materials, whilst, at the same time, there was an increased demand for qualified instructors; and orders for pictures and elementary lessons and copies were so numerous from Madras and other localities, that it was found impossible to execute them. Native pupils have not enjoyed the same facilities for obtaining employment as East Indian pupils, and the consequence has been that more steady progress has been observed, particularly among those of advanced years. "A good many of this class of pupils have devoted the whole of their time and attention to drawing, and some have spent from eight to ten hours daily in the school. The East Indian pupils have shown the greatest amount of assiduity, freedom, and boldness in designing and copying. The Natives have excelled in precision of touch, clearness and accuracy of outline (which may in some manner be attributed to their early familiarity with the practice of drawing mathematical patterns on the floors of their houses), and by their patience and industry they have acquired a more thorough knowledge of the rudiments of art."

It appears that the total number of pupils who have received artistic instruction in the school since its establishment has been 472, of which number a good many have been able to procure remunerative situations from their proficiency in drawing.

Native pupils, mentioned in the Report, have been selected as the best qualified to execute copies of the prize designs and of the studies in the school, for which there appears to be a demand in India.

The system of instruction in the school has lately been improved by confining the pupils to progressive lessons in the rudiments of a few branches—as geometrical and architectural drawing, ornamental designing from natural plants, botanical and landscape drawing. Desultory efforts in the higher branches of art have been discouraged. "The system of offering small monthly prizes for original designs from particular plants," says the Report, "has worked exceedingly well, and brought out many of our early pupils into the field as competitors, besides calling forth a great amount of native artistic talent, of which we had no knowledge. As a proof of this, sixty-two large designs from plants were forwarded to the school within six weeks from the time of advertising three prizes of ten, seven, and four rupees." "On another occasion, when two prizes of ten and seven rupees were advertised for the best collection of designs drawn by native women in front of their doors, nearly 400 patterns were forwarded, and many of them were remarkable for careful and most difficult geometrical drawing, as also for taste in the arrangement of colours."

The amount earned monthly by the pupils who have obtained situations for their proficiency in drawing, is stated to have amounted to 592 rupees.

These facts show that the arts are beginning to be appreciated in India; and if there were proper facilities for educating pupils, they would have no difficulty in obtaining remunerative situations. The Report states, that the results of the Committee's "labours in the industrial department have been very satisfactory, though a great deal more might have been accomplished had skilled artizans and more ample funds been available. It may be as well to mention, that this branch of the school was commenced for the purpose of trying to point out the practical application to the arts and manufactures of a few of the raw materials which are abundant and cheap in India."

With the small sum of 2,000 rupees it could not be expected that anything like an efficient manufactory could be set on foot.

The Committee therefore resolved, "that as soon as any branch of industry promised to be lucrative, or held out a fair prospect of being taken up by private enterprise, encouragement should be given to the public, or to private individuals, to enter into the field."

Three branches of industry which have been taught in the schools have been thus taken up, and it is said each promises to be remunerative. The first branch was the making of paper, and various native sources of raw material, such as the aloe, plantain, and others, were made use of with success; but the experiments have since been taken up by a wealthy native, who has imported European machinery, and he has been very successful. Samples have been forwarded to Kew and Edinburgh.

The native raw materials used in the manufacture of paper soon attracted the attention of the mercantile community as being adapted for cordage, and samples have been prepared which hold out considerable promise of success. It appears, however, that the fibre from the aloe is the only one which approaches the strength of European and Russian hemp.

The next branch attempted in the school was the manufacture of pottery. "The orders in this department," says the Report, "have been far more extensive, and would prove highly remunerative if the work could be turned out with rapidity, regularity, and certainty; but unfortunately a great deal which was good at the first, or biscuit firing, has been completely spoiled in an attempt to perfect the glazing."

The process has been worked solely from books; and there is no doubt that if proper European instructors could be obtained, the difficulty could be readily overcome.

The Report adds that, "Another satisfactory result of their industrial labours has been the discovery of a variety of raw materials from the vegetable and mineral kingdoms, suited for employment in the arts and manufactures of them,—the most important have been good woods for engraving, carving, decoration, and useful purposes; a few vegetables, and a great variety of mineral colours — extensive beds of clay, and materials for every variety of porcelain, pottery, glass, and enamel; several materials in great abundance—marbles, lithographic stones, and grindstones of every quality, gypsums, selenites, and cement stones; and lastly, corundum and emery in a number of different localities. * * * * large and remunerative orders have been received for them; but one or two other substances of no value are so easily mistaken for them, that care and scientific knowledge are required in their selection."

It appears that the East India Company have sanctioned a grant of 6,000 rupees for the use of the Institution; and it is hoped that the increased encouragement which the arts are thus receiving in India, may prove a guarantee for further liberal support on all sides.

The Committee, in a letter addressed to the Chief Secretary of the Government at Madras, thus state their views:

"In conclusion, we think it right again to explain our views as to the true province and design of this Institution, with reference to the remarks of the Honourable the Court of Directors, as to the prospect of the schools becoming eventually independent of Government aid, a point which they consider indispensable. We submit that the great object to be aimed at, and to which other Institutions of the same character are directed, is not the effecting of such profits as to render them remunerative, but by showing the feasibility of various objects to open up a way into which private capital may be profitably diverted—like the Institutions in Europe above alluded to; their province is not commerce, but science, though only such science is pursued as is calculated to promote commerce: while therefore we see no reason to doubt that sufficient remunerative work would be accomplished to meet in part the pecuniary liabilities of these Institutions, we do not expect, nor would it be consistent with their character and design to expect, that they will prove so far remunerative as to become independent of extraneous support. To repeat the concluding observations of our former letter, we do no anticipate that these Institutions will be themselves money-making establishments; but we do anticipate that they will show how money is to be made. The legitimate province of these schools will be in the first place to experimentalize; and then when the experiment has succeeded, not to monopolise the manufacture so produced, but leaving it to be taken up by private capital, and private enterprise, to pass on to some other branch of manufacture. In a word, we regard these Institutions as likely to become useful pioneers, pointing out the road to various fields of remunerative labour, clearing away the obstacles that obstruct it; and by leading the way, encouraging a class too prone to regard handicraft operations as degrading, to enter upon a sphere of honourable, manly, useful, and profitable exertion."

CHEMISTRY AND PERFUMERY.

It will be remembered that Dr. Playfair, in his lecture "On the Chemical Principles involved in the Manufactures of the Great Exhibition," adverts to the fact, that "some of the most delicate perfumes were made by chemical artifice, and not, as of old, by distilling them from flowers." He goes on to state that perfumes thus prepared were sent to the Exhibition, and that "singularly enough they are generally derived from substances of an intensely disgusting odour. A peculiarly fœtid oil, termed 'fusel oil,' is formed in making brandy and whisky." "Putrid cheese," a "soap made with butter," "the fœtid oils of gas-tar," and "the drainings of cowhouses," are those stated to be the main source to which the manufacturer applies for the production of his most delicate and admired perfumes. Professor Fehling, in the Wurtemburg *Journal of Industry*, gives an abstract of what is at present known respecting the composition of some of these artificial essences. The following is a description of these extracts, and of their manufacture:

Pine Apple Oil.—This product consists of a solution of 1 part of butyric acid ether, in 8 to 10 parts of spirits of wine. For preparing butyric acid ether, pure butyric acid is required, and this is obtained most readily and in greatest quantity, by the fermentation of sugar, or of St. John's bread (*siliqua dulcis*). For preparing butyric acid from sugar, M. Bentch takes a solution of 6 lbs. of sugar and half an ounce of tartaric acid in 26 lbs. of water, which is left to stand for some days; at the same time about a quarter of a pound of old decayed cheese is diffused in 8 lbs. of sour milk, from which the cream has been removed; and after this has also stood for some days, it is mixed with the first solution, and the whole is kept from four to six weeks at a temperature of about 24° to 28° Reaumer, water being added from time to time to replace that which is lost by evaporation. After the evolution of gas has entirely ceased, the liquid is dissolved with its own bulk of water, and finally 8 lbs. of crystallized soda, dissolved in 12 lbs. to 16 lbs. of water, are added to it. The liquid is then filtered and evaporated till it weighs only 10 lbs., when a quantity of 5½ lbs. of sulphuric acid (*nordhausen*, or fuming sulphuric acid), diluted with 5½ lbs. of water, is carefully mixed with it by small portions at a time. The butyric acid, in the state of an oily substance, will now appear on the surface of the liquid, from which it may be skimmed off; but as the remaining liquid still contains some butyric acid, it is submitted to distillation, by which means another portion of diluted butyric acid is obtained, which may be concentrated by means of melted chloride of calcium, or by saturating it with carbonate of soda, evaporating and decomposing by sulphuric acid. By this method 1¾ lbs. of pure butyric acid are obtained from 6 lbs. of sugar.

M. Marsson says that the same product may be obtained from St. John's bread (*siliqua dulcis*), by taking 4 lbs. of mashed St. John's bread, and mixing it with 10 lbs. of water and 1 lb. of chalk; the liquid matter must be maintained from three to four weeks at a temperature of from 25° to 35° Reaumer, and be often and well stirred, and from time to time the water that has evaporated must be replaced. After fermentation has ceased, a quantity of water equal to the bulk of the liquid is added, and afterwards a concentrated solution of 2½ lbs. or 2¾ lbs. of carbonate of soda, when it is finally evaporated. To the concentrated liquid is then added 1½ lbs. to 2 lbs. of sulphuric acid, diluted with 2 lbs. of water; and the remainder of the process is performed as already described. By this method a little more than half a pound of coloured butyric acid will be obtained. The acid, however, retains a peculiar smell from the St. John's bread, which continues even in the ether prepared from the same; whereas that prepared from sugar gives an ether of a very pure smell. It will be found advantageous to agitate the oily butyric acid with chloride of calcium, in order to deprive it entirely of its moisture.

For preparing butyric acid ether (butyrate of oxyde of ethyle) from butyric acid, 1 lb. of butyric acid is dissolved in 1 lb. of rectified alcohol (95° Tralles), and is mixed with one-half to one-fourth of an ounce of concentrated sulphuric acid; the compound is heated for some minutes, when the butyric acid ether will form a thin layer on the top. The whole is then mixed with half of its bulk of water, and the upper layer taken off; the remaining liquid being submitted to distillation, yields another quantity of butyric acid ether, which is mixed with that obtained in the first instance, and the whole well agitated with a very diluted solution of soda, in order to deprive it of all the acid; which operation should be repeated several times if a very pure ether is desired to be obtained. Care should be taken to use but small quantities of the diluted soda solution at a time, so as not to lose too much ether, this latter being in some measure soluble in water. When large quantities are to be acted upon, the washing water (*eau de lavage*) is collected, mixed with an equal volume of spirits of wine, and distilled, by which means a solution of pure butyric acid ether in spirits of wine is obtained.

Butyric acid ether may be also obtained immediately from butyrate of soda, by dissolving 1 part of this salt in 1 part of rectified alcohol, adding 1 part of sulphuric acid, and heating some minutes. The ether collects on the top of the liquid, and is purified by washing with water and with diluted soda solution.

For preparing pine-apple oil, 1 lb. of butyric acid ether is dissolved in 8 lbs. to 10 lbs. of spirits of wine, which should have been previously deprived of its empyreumatic or fusel oil. Pure French spirits of wine will be found best suited for this purpose. According to the purpose for which the pine-apple oil is to be applied, either rectified alcohol of 80° to 90° Tralles, or brandy of 40° to 50°, should be used for dissolving the ether. 20 drops to 25 drops of such an extract will suffice for giving a strong pine-apple odour to 1 lb. of sugar solution, to which some acid, such as tartaric or citric acid, is generally added.

Bergamot Pear Oil.—What is called pear-oil is an alcoholic solution of acetate of oxyde of amyle, and acetate of oxyde of ethyle, prepared from potato fusel oil (the hydryte of oxyde of amyle). The potato fusel oil, or oil of potato spirits (in German, *fuseloel*), is the compound distilled over towards the end of the first distillation of spirits made from potatoes, and is an oily liquid of a very strong and nauseous odour. This oil, in the state in which it is obtained from large potato brandy distilleries, is never pure; but it may be purified by agitating it with a diluted soda solution, when the pure fusel oil collects as an oily layer on the top of the liquid; this oily substance is then submitted to distillation, and that part which distils over at 100° to 112°, Reaumer, is collected, and forms the pure fusel oil.

For preparing acetate of oxyde of amyle from this fusel oil, 1 lb. of pure ice vinegar is mixed with an equal quantity of fusel oil, to which is added half a pound of sulphuric acid; the liquid is digested for some hours at about 100°, when the acetate of oxyde of amyle separates, particularly on being mixed with a small quantity of water. The remaining liquid, when mixed with more water, yields, on being submitted to distillation, a further quantity of acetate of oxyde of amyle. The entire mass of oxyde of amyle thus obtained is now agitated several times with water and a little soda solution, in order to deprive it of all free acid.

The acetate of oxyde of amyle may also be obtained by taking 1 part of fusel oil to 1½ parts of dry acetate of soda, or 2 parts of acetate of potash, with 1 to 1½ parts of sulphuric acid. The liquid having been kept for some time at a gentle heat, the acetate of oxyde of amyle is separated by adding water, and proceeding as above explained. 15 parts of acetate of oxyde of amyle are mixed with 1½ parts of vinegar ether (vinegar naphtha, acetate of oxyde of ethyle), and dissolved in 100 to 120 parts of spirits of wine, as in the case of pine-apple extract; an acid—for instance, tartaric or citric, should be added to the sugar solution, on making use of the pear extract, which addition makes the flavour of the bergamot pear better distinguishable, and the taste acquires at the same time more of the refreshing qualities of fruit.

Apple Oil.—What is called apple oil, is a solution of valerianate of oxyde of amyle in spirits of wine, which may be obtained as a secondary product when fusel oil is distilled with chromate of potash and sulphuric acid for the preparation of valerianic acid. The light solution which collects in the tops of the distilled liquid contains valerianate of oxyde of amyle, together with other liquids, such as adehyde, which gives to the product a less agreeable taste and smell. It is therefore to be preferred for preparing pure valerianate of oxyde of amyle.

For preparing valerianic acid, 1 part of fusel oil is mixed by small portions with 3 parts of sulphuric acid, and afterwards 2 parts of water are added. At the same time, a solution of 2¼ parts of bichromate of potash in 4½ parts of water is heated in a tubular retort; the first liquid is then permitted to flow very slowly into the liquid of the retort in such manner that the boiling continues but very slowly. The liquid which is distilled over is saturated with carbonate of soda, and is evaporated either to dryness for obtaining valerianate of soda, or to the consistency of syrup, when sulphuric acid is added (say 2 parts of concentrated acid diluted with the same quantity of water, for every 3 parts of crystalline carbonate of soda). The valerianic acid forms an oily layer on the upper part of the liquid, which latter will still yield some valerianic acid on being submitted to distillation. For preparing valerianate of oxyde of amyle, 1 part by weight of pure fusel oil is mixed carefully with an equal quantity by weight of common English sulphuric acid; the resulting solution is added to 1¼ parts of oily valerianic acid, or to 1½ parts of dry valerianate of soda, and is treated by a water-bath and then mixed with water, by which means the impure valerianate of the oxyde of amyle will be separated; this is washed several times with water, afterwards with a solution of carbonate of soda, and finally again with water. In preparing this compound, it is essential that the mixture of sulphuric acid and fusel oil with valerianic acid should not be heated to a too high degree, or too long, as the product would thereby acquire an insufferably pungent smell when required for use. 1 part of valerianate of oxyde of amyle is dissolved in 6 or 8 parts of spirits of wine, and acid is added in the same manner, as has been before explained in the preparation of other extracts.

Artificial Oil of Bitter Almonds.—When Mitscherlich, in 1834, discovered nitro-benzole, he little thought, after twenty years to find this body in an industrial exhibition. He certainly, at that time, pointed out the remarkable resemblance which the odour of nitro-benzole had to that of bitter almonds; but the only sources for obtaining benzole at that time, viz., the oil of compressed gas, and the distillation of benzoic acid, were much too expensive, and put an end to the idea of substituting the use of nitro-benzole for oil of bitter almonds. Mansfield, however, in 1849, showed, by careful investigation, that benzole may be produced easily and in large quantities from oil of coal tar, and this discovery has not been lost sight of in the arts. Among the articles of French perfumery in the Great Exhibition, with the title of *artificial oil of bitter almonds*, and the fanciful name of *essence of Mirbane*, there were several specimens of oils, which consisted of more or less pure nitro-benzole. The apparatus used in the preparation of this substance is that proposed by Mr. Mansfield. It consists of a large glass worm, the upper end of which branches into two tubes, which are provided with funnels. A stream of concentrated nitric acid flows slowly through one of these funnels, whilst the other is for the benzole (which for this purpose need not be absolutely pure). At the point at which the tubes of the funnels are united, the two bodies come in contact, the chemical compound formed becomes sufficiently cooled in passing through the worm, and only requires to be washed with water, and finally with some weak solution of carbonate of soda, to be ready for use. Although the nitro-benzole closely resembles oil of bitter almonds in physical properties, it possesses, however, a somewhat different odour, readily recognised by a practised person. However, it answers well for scenting soap, and would be extensively applicable for confectionary and for other culinary purposes. For the latter purpose it has the special advantage over oil of bitter almonds, that it contains no prussic acid.

The American Annual of Scientific Discovery, speaking on this subject, says, "The composition and artificial production of the various extracts of fruit and other similar perfumes and essences, strikingly illustrates the wonderful progress which has been made in organic chemistry within the last few years. A position has been taken by some chemists who have carefully investigated this subject, which cannot at present be controverted, that the extracts or perfumes of the various fruits which can be artificially prepared in our laboratories from the basic organic radicals, are identical, and the same with those which nature carefully elaborates in the apple, the pear, the pine-apple, banana, and the like. The whole subject has been investigated more carefully, and has been applied to more practical purposes than the public is generally aware of. Take, for instance, the well-known perfumes known as 'Lublin's Extracts,' extract of geranium, millefleurs, new-mown hay, and many others; all of these are said to be prepared from two or three of the common and cheap essential oils, and from the organic radicals. In addition to perfumes the most agreeable, odours of the most disgusting and nauseous character can also be produced by like means; as for instance the odour of the bed-bug, squash-bug, and of many of the common weeds and plants. As an odour or perfume of a different character can be produced by the action of each different acid on the different oxides of the organic radicals, the number of bodies of this character capable of being produced is almost innumerable, and may possibly embrace every known odour or perfume which is now recognized in the animal, vegetable, or mineral kingdom.

"The various artificial extracts of fruit have been applied to the flavouring of an agreeable species of confectionary known as the 'acidulated fruit drops.' These have been denounced as poisonous by some persons, on the ground that fusel oil is known to produce deleterious effects; and as a natural consequence the confectionary referred to has been discarded. There is, however, no foundation for such statements or belief; and if the confectionary flavoured with these extracts has in any case produced injurious effects, it is undoubtedly to be referred to an injudicious consumption of it, and not to any inherent deleterious property."

NEWSPAPER STATISTICS.

The towns in England alone, sending Members to Parliament, and not having even a weekly newspaper, may be thus classed:

	Towns.	M.P.	Population.	Constit.
With a population under 5,000	13	19	55,808	3,896
Over 5,000 and under 10,000	39	74	334,757	20,160
,, 10,000 ,, 20,000	15	24	178,373	11,275
,, 20,000 ,, 30,000	5	6	134,424	5,044
,, 30,000 ,, 40,000	5	8	166,159	6,880
40,000, and upwards	2	4	118,411	4,657
	79	135	987,932	51,912

The unrepresented towns in England alone, containing 5,000 inhabitants and upwards, and not possessing even a weekly newspaper, may be classed as follows:

	Towns.	Population.	
Over 5,000 and under 10,000	62	402,857	
,, 10,000 ,, 20,000	21	245,716	
20,000, and upwards	3	65,873	
	86	714,446	
Add to these — Represented Towns ...	79	987,932	
And we have — Towns ...	165	1,702,378	without even a Weekly Newspaper.
Deduct Represented Towns with less than 5,000 inhabts.	13	55,808	
And we have in England alone, Towns containing 5,000 inhabts. and upwards	152	1,646,570	without even a Weekly Newspaper.

In the Channel Islands (where there are no Taxes on Knowledge), with a population of a few thousands, there are three bi-weekly, one tri-weekly, and eight weekly newspapers.

In the United States, a town with 2,000 inhabitants is seldom without a weekly paper; or a town with 15,000 inhabitants without its daily paper. In England, no daily paper is published out of London.

AUSTRALIA.

There are few incidents in the history of colonisation more remarkable than that afforded by the present position of our South Australian possessions. We have in the province of Victoria a population of under 200,000, absorbing British products to the amount of above 4,000,000*l.* per annum, and at the present moment we have upwards of 1,200 ships of great tonnage employed in the transport of British energy and manufactures to aid in the great progress now in course of development. In return for this we have an enormous flow of wealth, greatly exceeding in real value the amount above specified, resulting from the unprecedented productiveness of the gold fields. While these last maintain their present character, Victoria will not cease to be the great point of attraction to English personal enterprise. Putting aside the possibility, or rather probability, that under the present system the gold produce must decrease, there are other matters, which induce the confidence that Australia, under proper management, will maintain its prosperity. One past fact alone will go far to prove this:—the wool of New South Wales and South Australia has given a new character to European clothing within the last few years, and has entirely superseded many other sources of this necessary material—one only among a large variety that Australia might readily and profitably bring into existence.

There are several subjects lately brought before the world which evidently will tend to establish and enhance this prosperity, and a brief allusion to them will not be uninteresting. First, as to perfecting the present means of realizing wealth. The ore-grinding machine by Mr. Berdan, described at page 551 of the Journal, promises, if its capabilities are correctly stated, to change greatly the present system of hand-washing, the most tedious, wasteful, and uncertain of the gold producing methods. The balance of wealth which will doubtless increase by this and other methods, improvements on the past, will certainly lead to the necessity for fresh fields of enterprise, and it is most important that these efforts should be well directed.

The important expedition about to leave England under the direction of Mr. Ernest Haug, a gentleman of great energy and extensive acquirements, will certainly lead to great results, if the intended exploration prove successful. The intention is for the scientific nucleus of this expedition to proceed to Aden and Singapore, where it will organize the party. Thence to the islands east of Java, where animals for conveyance will be procured. Thence landing at the Victoria river, the expedition will proceed to the south east, and ascertain the direction of the mountainous range, which it is presumed runs from the northern part of the colony of New South Wales towards Port Essington, and separates the river systems flowing northward and southward. This route, if carried out, will lead to the centre of the continent, whence it is thought it would be better to turn southwards towards the southern colonies.

The determination of the characteristics of the country thus traversed must have a fundamental bearing upon the direction in which colonization should be fostered. In the case of Captain Sturt's celebrated journeys, it was all important to the welfare of Adelaide and South Australia that attention should be directed to the then almost unknown Gipps's Land. That the enterprising originator of the present expedition may meet with every success, is ardently to be wished.

The next point is the result of former exploration. Mr. Trelawney Saunders, well known in the geographic world, proposes a new colony, under the name of "Albert," at the head of the Gulf of Carpentaria, on the north side of Australia. The site of the settlement will be on the Plains of Promise, so glowingly described by Capt. Stokes, R.N. Besides the excellence of the land, the position, it is thought, will command the commerce of that part of the Indian Seas, being the south-eastern extreme of an Asiatic Mediterranean, as the free port of Singapore is at the north-west end, and will thus lead the trade down to the existing Australian population. Other interesting topics contained in the excellent little work privately distributed by Mr. Saunders might be alluded to; but this new sphere, embracing, as it does, a great distinction of climate, will lead to the production of new articles of commerce, among which may be specified *cotton*, olive oil, and wine.

But in order that these advantages may be duly realised by a readily attainable market, which Europe alone at present affords, it is desirable that the means of transit for goods and passengers should be as certain and easy as that which has led to the colonisation of the vast territories of the United States by a British population. And here may be noticed the establishment of a new line of communication with our antipodal colonies.

The Australian *Direct* Steam Navigation Company, established by the enterprising talent of Captains A. S. Hamond and J. C. Hoseason, R.N., and the Australasian Pacific Mail Steam Packet Company, will supply a very serious deficiency in the mutual position of these colonies and parent country. All must remember the disastrous failures of the steam voyages round the Cape of Good Hope—a route characterised by the *Athenæum* as "fit only for convicts, midshipmen, and Colonial-office despatches;" and the great injury they inflicted on the interests of the colony. But these steamers had to encounter every sort of adverse circumstances, which the western route across the Isthmus of Panama does not present. The route proposed, in each case, separates itself into three stages—from Milford Haven, or Southampton, to Aspinwall on the Isthmus; the railway transit of two hours to Panama, and the passage across the noble Pacific, whose characteristics amply bear out its title, and offer, to passengers especially, the most delightful navigation in the world; the hurricane, the icebergs, and stormy weather of the Cape of Good Hope are entirely unknown. The stopping-place between Panama and the destination is to be the classic Tahiti, or, what might be better, the Gambier Islands, at the eastern extremity of the dangerous Paumotu Group. The difference in the respective distances is not so considerable; but the time to be occupied in the transit is more manifest, being only fifty-five days. Of the minor details of this important undertaking it is needless here to speak; but there is one fact which our engineers should endeavour satisfactorily to explain, and that is, the abandonment of the screw for the former paddle-wheel as a propeller. This is in opposition to the usually received opinion as to their respective merits, and is deserving of some serious attention.

With these topics, so new and so important, it must be convincing to all that these distant lands, whose capabilities were totally untried within the memory of many now living, and the whole progress of which has commenced, as it were, yesterday, must play an important part in the future history of the world.

BANK-NOTES AND PHOTOGRAPHY.

Paragraphs have lately appeared in the papers, stating that frauds have been practised on the Bank of England, by counterfeit notes produced by the agency of photography. We are enabled to state, on undoubted authority, that there is not one word of truth in the paragraphs referred to. No attempt of the kind has been made. The difficulty, indeed the impossibility, of producing fac-simile Bank of England notes by any photographic process which would escape detection, is well pointed out in a letter to the *Times*, by Mr. E. G. Wood, one of the members of this Society. He says:

"The alarm that may be excited by such a paragraph would be quite unfounded, for the detection of the fraudulent note is very easy.

"The watermark of the bank-note results from a difference in the substance of the paper, and is only visible by transmitted light; that is, when the note is held up so that the light may pass through it, it being in the body of the paper.

"Now, the imitated watermark would be on the surface only, and it would be produced by a slight darkening of the front of the note, corresponding exactly with the thicker portions of the paper of the note it was copied from, and would, therefore, be visible by reflected light as well as by transmitted light, and would be on the front only, and not on the back as well; and consequently, by doubling a note so produced, so as to see at the same time part of the back and part of the front, the fraud would be at once detected, as the watermark would not be on both."

ELECTRIC TIME-BALL AT THE ROYAL OBSERVATORY, EDINBURGH.*

A time-ball, similar to that at the Royal Observatory, Greenwich, and other places, has just been erected on the top of Nelson's Monument, Edinburgh, with electric communication to the Royal Observatory there. The machinery has been constructed by Messrs. Maudslay and Field.

The mode hitherto adopted for setting chronometers has been to adjust a clock in one of the out-buildings of the Observatory daily to the true time, and the various chronometer makers of Edinburgh and Leith, the mariners in the Docks and Firth, and others, have sent messengers with portable time-pieces to procure the indications of the clock. But this method evidently gave excessive trouble to all concerned, and marred the result most prejudicially; for when a chronometer is carried all the way from Leith to the Calton-hill and back, the shaking that it gets must greatly alter its rate.

The earliest signal-balls which were made, though provided with ropes passing over pulleys by which they were enabled in their descent to raise a series of weights in order to check in a gradual manner the velocity of their fall, were yet invariably found, after a short time, to pull or to smash themselves to pieces. Steel springs were next tried to break the force of the concussion, but were pretty sure to be themselves snapped with a heavy ball, while a light one would not descend quick enough on a windy day. Recourse was finally had to compressed air, a spring of perfect temper, never injured by time, and capable of any degree of delicacy at first, and any amount of violent resistance at last.

To carry out this principle, a staff was attached to the ball below, terminating in a piston, which in the course of its descent entered an accurately-turned cylinder, and compressing the air therein, was gradually brought to rest. Were the cylinder quite closed at the bottom, the spring of the included air might be greater than required, and also have a tendency to throw the ball up the mast again, which would be somewhat troublesome to observers. But by simply opening a graduated aperture below, so as to admit of the air partially escaping as it is compressed, the strength of the spring is diminished, and by the time that the piston has descended to the lowest point, there is so little air remaining in the cylinder, and it is still escaping so fast, that there is no power left to make the ball rebound.

Thus the time-ball is made to descend without injuring the building or spoiling itself; and the trigger apparatus, by which the detent that holds the ball when hauled to the top of the mast is unlocked, being very nicely adjusted, and observers being duly cautioned to look to the instant of *separation of the ball from the cross-staff*, the descent—that is, this first part of it—is as instantaneous as need be. In the next place, the trigger being pulled, not by the finger of a person at the ball, but by an electro-magnet which is instantaneously set in action by the contact made at the end of a wire led into the walls of the Observatory, and brought immediately before the transit clock itself; the instant for the signal outside can be conveyed to the undeviating mechanism there with all the refinement of a chamber experiment, and to the utmost extent of the observer's knowledge of the real time by the stars, as obtained the previous night, and continued on by the clock.

For raising the ball, a plan has been proposed, by which a weight having been wound up at *any previous hour of the day or night*, then on electrical contact being made at the Observatory by the astronomer at a precise moment, that weight is unlocked, immediately descends, and hauls up the ball. Next at five, or any other number of minutes, a second contact being made on another wire, lets the ball down.

It has been suggested to place the Observatory at Edinburgh in galvanic connection with that at Greenwich, so that Greenwich mean time, which mariners always require, and Edinburgh citizens do at present, should be exhibited in place of the local time; and this, it is believed, will shortly be done.*

HOME CORRESPONDENCE.

FLAX, AND ITS PRODUCTS, IN IRELAND.

Contributed by William Charley, Seymour-hill, Belfast.

LETTER I.

Before giving any details of the different improvements now in progress, I think a brief history of the establishment in this country of flax cultivation and manufacture will be interesting to your readers.

The first mention on record of Irish linen occurs so far back as the thirteenth century (*see* Maddox's "History of the Exchequer"); but it was not until the seventeenth century it acquired any national importance. It is a curious circumstance, that during the reign of Charles II. the extension of the woollen manufacture appears to have made such rapid strides that the jealousy of the English manufacturers was fiercely aroused. Protection in its most bigoted form was the practice of those times, and consequently we find an Act passed by the British

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* Abridged from the *Scotsman*.

* The means of working the Greenwich time signals will be found described by Mr. C. Shepherd, jun., at page 85 of this Journal.

Parliament prohibiting any export of wool from Ireland except to England and Wales.

Not content with this, in the tenth year of William III. another Act was passed, founded on the Report of a Special Committee, forbidding any export whatever from Ireland of wool or woollen manufacture. The reasons given by the Committee for their recommendation were, that the English trade must be preserved, and that wool and labour being so much cheaper in Ireland than in Great Britain, the manufacturers there could not compete at all successfully with the sister country, Hibernia.

The woollen trade being thus reduced to the quantity required for home consumption, of course rapidly declined, and its place was soon taken by the linen manufacture. We find, in Queen Anne's reign, the Irish House of Commons sent a Bill in favour of the linen trade to Her Majesty, accompanied with an address requesting permission from the English Parliament to export this article to the British colonies! The English ministers, after crushing the woollen trade, always appeared anxious to encourage that of linen, in which the Irish had for competitors the French and Flemish artizans (*see* Crawford's "History of Ireland," published 1783). The celebrated Lord Strafford not only favoured this new branch of industry by his protection and countenance, while Lord-Lieutenant of Ireland, but embarked a large sum himself in the trade.

This noble linen merchant was the originator of many improvements: he brought over from the Continent a number of spinners and manufacturers, who taught our countrymen the superior systems of treatment in operation there.

To no one, however, are we more indebted, than to M. Louis Crommelin, who, after the repeal of the Edict of Nantes, A. D. 1699, fled from France, and settled in the neighbourhood of Lisburn. He was accompanied by a number of refugees, and being acquainted with the French manufacture, he greatly improved the linen trade in his adopted country. Eight years after, the Irish Parliament confirmed the establishment of the linen trade in Ulster, and in 1711 a Board of Trustees was formed to encourage and extend the rising manufacture. Among others expedients, the Duke of Ormonde, the then Lord-Lieutenant, directed that hat bands and scarfs of linen should be used at funerals, which custom prevails to the present time, but was intended at first as a stimulus to consumption. At this period the machinery in use was very simple and worked principally by hand; soon after, in 1725, new machinery was invented and applied for many of the processes, and in 1764 Dr. James Ferguson, of Belfast, received a premium of 300*l.* from the Linen Board, for the successful application of lime in linen bleaching. In 1770, the same gentleman introduced the use of sulphuric acid; up to this period the usual acid employed was buttermilk, and the soil of cattle was also commonly applied instead of alkali. After this year improvements rapidly took place, potash for making ley to boil the yarns and cloth coming into use in 1780, and that most valuable bleaching agent, chloride of lime, in 1795 (*see* Pilson's "History of Belfast.") During the past fifty years improvements in every branch have continued to go on; but these I will defer describing for the present. In my next letter I purpose giving a short account of the operations of the Linen Board for the twenty years preceding its dissolution, and also an outline of any important changes in the manufacture of linen from that time down to the present. This will complete the chain of past history, and enable your readers to understand much more clearly any subsequent papers on existing and proposed improvements.

IMPROVEMENTS IN THE MANIPULATION OF SUGAR.

SIR,—In the ordinary process of refining sugar, the raw material—muscovado, or other sort of raw sugar—is first dissolved in the blow-up cistern, passed through cotton bags, then filtered through deep beds of animal charcoal, and finally the liquor is concentrated in vacuo.

Anteriorly to the introduction of animal charcoal into the sugar refineries, the raw sugar received a preliminary cleansing operation, either by the process of making meltings, or by the pneumatic curing method. Recently it has been proposed to filter through charcoal the drainage only of the cured sugar, and not the latter, and to pass through filter-bags the clarification of the two products amalgamated. By this method of refining sugar a saving of 75 per cent. of charcoal is obtained.

J. A. L.

STEAM FIRE-ENGINE.

39, Bedford-square, Oct. 13, 1853.

SIR,—On my return to town my attention has been called to the "Miscellanea" of the JOURNAL, No. 45, of the 30th ult., in which the American steam fire-engine is alluded to as a novelty, but whether as such in America or in principle altogether, is not quite clear; but I think it right to call the attention of yourself and readers to the steam fire-engine constructed years ago by myself, and kept for years at my own expense for the use of the public, and in the hope that it would be mutually beneficial. For the particulars of the English steam fire-engine I beg to refer you to the twelfth, seventeenth, and eighteenth volumes of the *Mechanics' Magazine*,—February 30th, 1830; May 26th, 1832; and October 6th, same year, when a steam fire-engine of great power was built for and sent over to the King of Prussia, capable of throwing ninety tons of water per hour to a height of 120 feet.

The steam fire engine—which was the one exclusively used in London, and whose powers were brought so conspicuously into play at the conflagrations of the Argyll Rooms, the English Opera-house, Wells-street, and of Barclay, Perkins, and Co.'s brewery—was about six horse-power. Its weight, with complement of water and fuel in the boiler, 45 cwt., required thirteen minutes to raise sufficient steam (as witnessed by the Commissioners of Police) to throw a stream of water equal to forty-five tons per hour over a pole ninety feet in height, through either one or two jets, as might be required. Such an engine, with the aid of the fire annihilator (Phillips's improved), would defy the spread of any fire —evidenced by what it did upon the above occasions already alluded to.

I shall be happy to afford any of your readers any further information or details upon the subject.

I am, Sir,
Your obedient Servant,
JOHN BRAITHWAITE.

PROCEEDINGS OF INSTITUTIONS.

CLAPHAM.—A very excellent lecture was delivered on "Popular Superstitions," on the evening of the 6th October, before the members of the Literary and Scientific Institution, by Mr. Joseph Simpson, Librarian, &c., of the Islington Institution. Several examples of the extraordinary fallacies connected with the idolatrous worship of the dark ages were referred to by the lecturer, and their continuance, in a somewhat modified character, even to the present century. He then proceeded to define the causes and effects of the more popular errors common amongst the uneducated masses of society, which he proved to be chiefly attributable to their ignorance of the simple laws of nature, and showed that most of the existing superstitions so firmly believed in by them as having a spiritual origin, were in reality to be easily accounted for by the ordinary operations of natural phenomena, as proved by the deductions of scientific researches. The lecture was interspersed with illustrations of the prevailing superstitions of many countries, the extremes to which a morbid desire for the possession of relics might be carried, the effects of a deep-rooted love of the marvellous, and the results, too frequently, of an unfortunate tendency of the belief that futurity can be explored, and of the confidence of the unwary in the promises and prognostications of the charlatan. Denouncing the still-continued publication of such books as Prophetic Almanacs, Dream books, and other similar productions, as detrimental to the morality and well-being of many thousands of our fellow-creatures, the lecturer concluded a most entertaining and instructive discourse, by pointing out the most efficient remedies for the evils arising from superstitious belief, in the domestic training of youth, a wider spread of religious and general education, and of scientific knowledge, strengthened by the formation of Literary, Scientific, and Mechanics' Institutions.

CHICHESTER.—On Wednesday evening, the 5th instant, the members of the Literary Society and Mechanics' Institute held their Annual Meeting in the Lecture-room at the Museum, when the Rev. J. Fullagar, Vice-president, took the Chair. The usual routine business was gone through, and the Secretary read the Report from the retiring Committee, which showed that the Museum had received numerous and important additions, and that it continued to attract a large share of public notice, not less than 1,980 visitors having inspected its contents during the past year. Among the donors, the most liberal contributors were the Duke of Richmond, Lady Reynall, Sir John Forbes, M.D., and H. W. Freeland, Esq. The Library had also been largely increased, including many works of standard merit, besides numerous ones of a more popular and interesting character. In the list of donations to this department were several valuable publications presented by the Society of Arts, and some of great antiquarian and historical interest presented by the Archæological Institute, and by Albert Way, Esq. The Report congratulated the members on the good attendance at the lectures during the last Session; and in presenting a new syllabus, a confident hope was expressed that the ensuing Session would prove yet more attractive than the last. The financial statement showed a balance due to the Treasurer of 11*l.*, which, together with some outstanding demands, made a deficiency of about 25*l.*, incurred to a considerable extent in outlays on repairs and improvements of the building, particularly the Lecture-room, which had been made to correspond in character with the Museum. There had, however, been an increase of members, the present number being 367. The Report closed with a tribute to the memory of the late J. B. Freeland, Esq., who for a period of twenty-seven years was a liberal supporter and Vice-president of the Mechanics' Institution, and subsequently of the amalgamated Society. The following officers were elected for the ensuing year: His Grace the Duke of Richmond was re-elected President; the Rev. J. Fullagar, Dr. Tyacke, B. Adams and W. Gruggen, Esqs., Vice-presidents; Mr. G. Paull, Treasurer; Mr. T. Pescod, Curator; and Mr. J. Gauntlett, Secretary, in the place of Mr. Cawthorne, resigned. On a ballot, the following gentlemen were placed on the Committee: Messrs. Allen, Barnard, Beatson, Cawthorne, Dale, W. W. Dendy, J. Farr, G. Irving, J. S. Jones, S. Merrick, Mittin, Molesworth, Pullinger, Rogers, Sawyer, Silverlock, T. Smith, and T. Spring. Messrs. Dudden and Gruggen were appointed Auditors; and the thanks of the meeting voted to the gratuitous lecturers during the past Session; to the Mayor, for the use of the Assembly-room; to the late Secretary, Mr. Cawthorne; and to the Rev. J. Fullagar, for his conduct as Chairman. On the following Monday a Concert, under the patronage of this Society, took place in the Assembly-room, when the Collins family afforded an agreeable evening's entertainment to a numerous company.

LEEDS.—Mr. Edmund Wheeler, has just completed a good practical course of three Lectures on the "Electric Telegraph," at the Mechanics' Institution and Literary Society. The course comprised a very comprehensive and lucid view of all the expedients employed for conveying information by voltaic, electro-magnetic, and magnetic agency. After describing the ordinary needle galvanometer index, now pretty generally understood, the Lecturer explained all the appliances for conducting the electric current to its destination, and applying it as required. Among the curiosities of the electro-magnetic science, from which very valuable results might be anticipated, was that of the continuance of an electric current by the water of a river without the use of wires; this had been in operation at Havre, on the Susquehannah, for several years, and had been tried experimentally on the Thames, and other rivers and canals; and if the principle could be extended to the broad waters, it was difficult to conjecture the limit of its application. The various submarine telegraphs and their appliances were described, and the Lecturer stated, that London is now in direct communication with Paris, Madrid, Venice, Trieste, and Cracow. Mr. Wheeler discussed the question of communication with America by telegraph; he thought ocean wires were not very likely to be laid down, but he considered either of the two plans proposed for a more circuitous route within the range of the practical, viz., the one by the north-western islands, thence to Iceland, Greenland, and over Davis's Straits to Labrador; or the eastern course, through Central Asia, to Behring's Straits, and so by the west coast of America to the great centres of civilization in the New World; the latter being the course proposed by Mr. Elihu Burritt. Mr. Wheeler delivered his course to large audiences, and by the completeness of his models, and other illustrations, and the remarkable clearness of his style, rendered the subject deeply interesting.

LOUGHBOROUGH.—The annual general meeting of the members of the Literary and Philosophical Society was held on Tuesday, September 27th, the Rev. H. O. Crawley, presiding. The Secretary, on reading the Report, announced the increased prosperity of the Society, both as regards the number of members, and its extended sphere of usefulness. Allusion was made to the advantages derived from the union with the Society of Arts, from whom had been received, in the course of the year, several valuable works; and from the List of Lecturers, lately received, a selection would be made for the ensuing session. The general business was proceeded with, after which the election of officers for the ensuing year was made.

READING.—The directors of the Literary, Scientific, and Mechanics' Institution, have recently resolved that mechanics shall be admitted to the Library, Classes, Reading-room, and Lectures, on payment of 6*s.* per annum; and that non-members should be admitted to the Reading-room, on the payment of 1*d.* each time.

SHERBOURNE.—The opening Lecture of the present session, at the Literary Institution, was delivered by Mr. W. J. Fox, M.P., on Monday, the 3rd inst. The President for the year, Mr. R. Gordon, presided; and after making a few preliminary remarks, introduced Mr. Fox, who had chosen for his subject, "The Last Census." In the course of his observations he said, that "those parts of the census which relate to education are not yet complete, but some of the results have been arrived at. The first impression we receive of them is one of high gratification. It is within the last half century that the education of this country may be said to have been created. Taking it only from 1818 to 1851, the increase has been in

Day-schools, in the country, from 19,000 to 46,000.
Scholars in day-schools, from 674,800 to 2,144,000.
Sunday-schools, from 5,000 to 23,000.
Sunday-scholars, from 477,000 to 2,407,000.

And if we take the proportion to the population, the number of children in day-schools has increased from 1 in 17 to 1 in 8: of Sunday-scholars, from 1 in 24 to 1 in 7. But there was, amidst all this, subject matter for regret. In the counties of Dorset, Devon, and Somerset, they had built schools very liberally, but they had actually school-room for twice as many children as went to the schools. Money had been expended in brick and mortar, not in teachers. They had 17,000 children in the schools of those counties, and schools large enough for 34,000. In some of our large towns the case was still worse. In Manchester alone there were 30,000 children of a school age,—that is to say, between four and fifteen, who were neither at school nor at work; and there were as many more in Liverpool." At the close of the Lecture, it was moved by Mr. W. C. Macready, seconded by Mr. Penney, M.P., that the hearty thanks of the meeting be presented to Mr. Fox, which was carried by acclamation.

SEVENOAKS.—On Thursday, September 22nd, Mr. Mottley, of Margate, gave a second lecture at the Literary Institution, "On Matter, Chemically Considered." The principal subject of the lecture related to that peculiar state or condition of matter termed allotropic. Mr. Mottley exhibited sulphur, carbon, and phosphorus in distinct condition, and observed that the allotropic change of state was justly considered as one of the most important developments of modern chemistry. It was to Professor Schönbein, of Basle, that science was indebted for the important fact that oxygen might exist in an allotropic condition—a subject of the gravest importance at the present time, when we were alarmed by the actual presence of a terrible epidemic. Mr. Mottley explained the various modes of generating ozone, as oxygen was termed when in a state of increased activity. Practically it was of importance, as indicating, by its presence, a pure state of the atmosphere—ozonized, or allotropic, oxygen being the great purifier, disinfectant, and deodorizer. Ozone was detected in the atmosphere by means of paper, rendered sensitive by being immersed in a mixture of iodide of potassium and arrowroot starch. The Lecturer exposed some of the prepared paper on a day particularly favourable to the presence of ozone, when the paper changed colour rapidly, and assumed a bright blue tint; but in confined, ill-ventilated, and unhealthy situations, it retained its original whiteness. Those localities where the paper remained unaltered were the chosen abodes of fever of various types,—thus clearly indicating the necessity of, as far as possible, opening the close, ill-ventilated courts and alleys in crowded cities to currents of air. The test for ozone was 1 part of iodide of potassium, 10 parts of arrowroot, and 100 parts of water, boiled for a short space of time. A little of this preparation being placed on paper, and dried, it formed Schönbein's test; a slip being introduced dry into the atmosphere supposed to contain ozone, and then moistened, instantly assumed a blue tint, the shade depending on the amount of ozone present.

WISBECH.—A General Meeting of the members of the Mechanics' Institution, was held at the Public Hall, on the 27th ult., when the following persons were elected as the Committee for the ensuing year: Messrs. Cunnington, Wherry, Bays, Oliver, R. B. Dawbarn, Bell, J. Batterham, Reynoldson, Haselwood, Hudson, and Poock. The Institution has been entirely remodelled; the rules have been modified, the library rearranged and catalogued, and a complete change has been made in the officers. Arrangements have been made with six gentlemen to deliver Lectures during the winter months; and in consequence it is supposed of these alterations, there has been a large accession of new members.

MISCELLANEA.

A MECHANICS' INSTITUTE ROBBED BY A MEMBER OF ITS COMMITTEE.—At the Colchester Petty Sessions, on Tuesday last, George Robert Coleman, twenty-six, whitesmith, a young man of superior education, was indicted for stealing 67 lbs. weight of newspapers from the Colchester Mechanics' Institution. The prosecutor was honorary Secretary of the Mechanics' Institution, and the prisoner a member of the Committee, who, until the bringing of this charge, had been looked upon with great respect, and had not only been a member for a considerable time, but had even benefited the funds of the Institution by giving occasional lectures. James Beaumont, apprentice to prisoner's father, proved that on an evening about four or five weeks ago he received of prisoner, behind his father's gate, a quantity of newspapers, which, by direction of prisoner, he sold to Mr. Carman, grocer, Wire-street, opposite, for 8s., and gave the money to prisoner. Witness also deposed to receiving 17 lbs. weight of newspapers from prisoner in a similar way, which he sold to Mr. White, glover, for 5*s.*, and gave the money to prisoner; also some to Mr. Hawley, grocer, St. Botolph-street. He recollected prisoner delivering a lecture on gas in February last, and shortly afterwards carried away a box of his from the Institution. Henry Saxty Garland, apprentice to prisoner's father, deposed to purchasing 11 lbs. of *Times* newspapers of prisoner for 2*s.* 3½*d.*, for the use of his mother, who was a pork and sausage dealer. He had heard prisoner lecture on chemistry and coal-gas, illustrated by his apparatus, but had not heard him discourse on Mr. George Dawson's subject of "Things Unseen," illustrated by engravings. Superintendent Kent deposed to receiving bundles of the *Times* newspapers from Mr. Carman, sold by prisoner's father's boy, and which he produced. About thirty of them bore the Institution stamp. Mr. Winch, the librarian, brought a bundle of papers from the Institution, and they compared them with the dates of those Kent received from the witnesses, but he did not suffer the Librarian's papers to be intermingled with his. Mr. John Winch, Librarian of the Institution, proved filing the papers and putting them away in the closet of the chess-room, where they were safe in July; and he did not miss them till September 13th. He had searched the file of papers, and missed all those containing the exact dates and file-marks produced by the police, and believed them to be the property of the Institution. Mr. Chambers offered what he considered explanations of the facts consistent with prisoner's innocence, and utterly inconsistent with his guilt. Prisoner's character, and the position he filled in the Institution, he contended, out-weighed all the evidence which was brought against him. It was very improbable that such an intelligent young man would have sacrificed his character, position, the love of his relations, the acquaintance and society of his friends, and everything which made life worth having, for the paltry motive of gaining a few shillings. After urging various arguments to show that the evidence was too incomplete to warrant a conviction, the learned Counsel left it, he said, for the Jury to say whether a young man occupying the position in an Institution in which he was a member ten years, an officer, and a lecturer, who was the only son of his parents, whose hearts were broken while he spoke, at the enormous peril in which circumstances had placed him—with no want unsatisfied, with no ill-regulated mind—to acquire 20*s.* at the expense of character, reputation, esteem, honour, integrity, or principle, but with every reason on earth to deter him from the commission of the crime, would have been guilty of the charge laid against him? In summing up, the learned Recorder said the Jury would give such weight to the pertinent observations of the learned Counsel for the defence as they deserved. If the Jury thought there was a reasonable doubt, they would give prisoner the benefit of it; but if they thought the evidence was satisfactory and conclusive, they would, however painful their duty, convict him. The Jury retired for about three-quarters of an hour, and returned with a verdict of guilty, but strongly recommended the prisoner to mercy. The Recorder, in sentencing prisoner, said he had been found guilty of a charge of larceny, after a very careful inquiry, and he thought no one in court was surprised at the conclusion at which the Jury had arrived. To the recommendation the Court gave such effect as it felt itself at liberty to do; but he could not conceal his belief that prisoner's case was a bad one; and he deplored his present position, as he had no doubt he did by that time himself. Prisoner was then sentenced to four months' imprisonment, with hard labour.

SALFORD ROYAL LIBRARY AND MUSEUM. — An addition has lately been made to this Library, which was opened in January, 1850, or before the Manchester Free Library. The exterior of the old building has not been altered, but the interior has been quite remodelled; another room has been added to the library, which now contains 11,000 volumes, providing room for 5,000 volumes, towards which Sir Benjamin Heywood has contributed 150 volumes of journals of Parliament; a large corridor, now filled with fine casts of statuary; a reading-room, of magnificent proportions, capable of accommodating 200 persons, for whom tables and benches are provided; a grand staircase, leading into an upper corridor; a large and well-lighted picture-gallery, and rooms for the reception of a collection of specimens of natural history, and of ethnological and antiquarian objects. At present, only about a third of the design has been carried out. The reading-room and picture-gallery form one wing, to which a corresponding one has yet to be built, and then the front has to be altered so as to complete the project. The means for erecting this addition have been provided in the following manner: the committee had about 1,000*l.* in hand; the Corporation of Salford gave 1,500*l.* out of the profits of the gas-works; and Alderman Langworthy, late Mayor of Salford, gave 2,000*l.*; but still a sum of 500*l.* remains to be provided.

SUBMARINE TELEGRAPH IN AUSTRALIA.—A submarine telegraph has been projected to connect Van Diemen's Land with Australia, in connection with a line to Melbourne. Mr. Rankin, in a report read before the Royal Society of Van Diemen's Land, made the following statements:—"At the eastern end of Bass's Straits, between Mount Wilson and Australia, and Cape Portland in Van Diemen's Land, there extends a chain of islands which afford remarkable facilities for the laying of a submarine telegraph to communicate through Melbourne with Sydney and Geelong. The submarine telegraph cable for this purpose will cost, at the present prices, including freight, about 100*l.* per mile, and may probably be obtained for 80*l.* It would consist of detached portions stretching from island to island, between Cape Portland and Mount Wilson, as also of two small portions, each about a mile or a mile and a half long, crossing the inlets on each side of Phillip Island, which appears to be a better route from Mount Wilson to Melbourne than to follow the main land the whole way. The total length of submarine telegraph required would be about 150 miles. The length of land telegraph required in connection with this line would be about 1,010 miles.

INDUSTRIAL SOCIETY OF FRANCE.—The Society for the Encouragement of National Industry in France has offered a prize of 1,000 francs for the best treatise "On the evils attending the universal Consumption of the Potato as an article of food."

INK FOR STEEL PENS.—Professor Runge has long sought to obtain an ink which would not yield sediment, which should adhere to paper, resist the application of acids, and have no action on steel pens. He has at length obtained a liquid of this kind, containing only Campeachy wood, chromate of potassa, and water. As it contains neither vinegar, gum, sulphates of iron and copper, nor galls, its cost is very moderate. The proportions are 500 litres decoction of Campeachy wood to 500 grammes chromate of potassa. The Campeachy wood is boiled in a sufficient quantity of water to form 80 litres (4½ litres = 1 English gallon) of decoction from 10 kilogrammes of wood (about 20lbs.) After the liquid is cool, the chromate is added, and the whole well stirred. The ink is then ready, and may be used at once. Any addition of gum would be injurious. It may appear strange that so little chrome should convert so large a quantity of decoction into ink; but the proportion must not be exceeded, as a larger amount would destroy the colouring matter. If, on the other hand, the proportions here given are observed, a blackish blue is formed from the yellow pigment of the wood. This is not a suspended precipitate, like the gallate of iron in common ink, but a true solution, from which no sediment can be deposited. A paper written with this ink may be immersed in water for twenty-four hours without injury. Dilute acids do not destroy it, or change its tint. The pens used with this ink should be perfectly free from grease, and may for this purpose be cleaned by immersing them in ley of wood-ashes.—*Artizan.*

AMERICAN TRADE COMPETITION IN INDIA. — The East India Court of Directors have transmitted to Mr. Hugh Fleming, for the use and information of the Manchester Commercial Association, some interesting items of intelligence respecting a branch of trade which enterprising Americans have opened with Central Asia. It is well known that the branch of the cotton trade in which the manufacturers of the United States can best compete with those in this country, is that in coarse fabrics. In these there is a heavy weight of low-priced cotton with comparatively little labour, and the charge of transit on the raw material to this country becomes an important item of cost, which the American manufacturers, with the cotton growing at their own doors, are able to save. The manufacture in question is a coarse unbleached fabric, such as in England would be termed towelling, but termed by the Americans sheeting, and is well suited to the wants of Asiatic communities. They ship a load of these sheetings to the coast of India with a supercargo on board, who takes charge of the sale, receiving in return such raw products as the natives can give, and as will meet a ready market at home; and a trade or barter of this kind is conducted at comparatively little cost to that which our merchants incur with large establishments at Bombay, and having to pay heavy charges for commissions, and for landing, shipping, storing, and duties.

PATENT LAW AMENDMENT ACT, 1852.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

From Gazette, 7th October, 1853.

Dated 10th August, 1853.

1864. W. E. Newton, 66, Chancery-lane—Preparation for facilitating drying of pigments. (A communication.)

Dated 10th September.

2091. S. T. Jones, 11, Trigon-terrace, Clapham-road—Propelling.
2095. T. W. Gilbert, Limehouse—Improvements in sewing sails, &c.

Dated 22nd September.

2189. T. Smedley, Holywell, Flintshire—Railway-train signal.
2191. F. C. Calvert, Manchester—Separating emery.
2193. E. Oldfield, Salford—Spinning machinery.
2195. G. White, 5, Lawrence Pountney-lane—Paddle-wheel.

Dated 23rd September.

2197. J. Leetch, Birmingham—Breech-loading fire-arms.
2198. C. Alexander, 373, Albany-road, Camberwell—Preparing inlaid work in veneers, and fixing the same to walls, &c., and on floors, and in rendering such floors water and fireproof.
2199. A. E. L. Bellford, 16, Castle-street, Holborn—Application of extract from pine-trees for dyeing. (A communication.)
2200. R. Varvill, 30, Highouse-gate, York—Mortising machine.
2201. W. Dantec, 5, New Quay, Liverpool—Purifying water.

Dated 24th September.

2202. J. G. Jones, Islington—Signals from one part of railway train to another.
2203. H. Tucker, Massachusetts—Applying colours to surfaces by means of a liquid.
2204. A. Dalgety, 76, Florence-road, Deptford—Lathes.
2205. W. Farmer, Fulham Brewery—Preserving provisions.
2206. C. E. Austin, Rookwoods, Stroud, Gloucestershire—Reaping machine.
2207. C. Maitland, Alloa, and W. Gorrie Rosemains, Cranston, N. B.—Heating water, &c.

Dated 26th September.

2208. J. Smith, Law Hill, Perth—Scythes.
2210. J. Ellesdon, London—Portable and convertible chairs.
2211. H. Winter, Castle-street, Holborn — Trousers without braces, &c.
2212. W. A. Biddell, Great Sutton-street—Alarums or signals for railways, ships, houses, &c.

Dated 27th September.

2214. R. Popple Beverley—Machinery for slubbing, roving, &c.
2216. W. P. Sharp, John Hill, and W. Martin, Manchester—Spinning machinery.
2217. J. Bury, Lower Mosley-street, Manchester, and W. Green, Islington—Treating, stretching, and finishing textile fabrics, and machinery for same.
2218. R. Brisco, Low Mill House, St. Bees, and P. S. Horsman, St. John's, Beckermel, Cumberland—Preparation of flax, &c.

Dated 28th September.

2220. L. D. Girard, Paris—Hydraulic engines.
2222. J. H. Johnson, 47, Lincoln's-inn Fields—Cutting paper.
2224. J. F. Van Waesberghe, Lokeren, Belgium — Artificial vinegar.
2226. T. Askie, Little Britain, London—Churns and agitating apparatus.
2228. M. O. B. Lesage, 16, Castle-street, Holborn—Hydraulic engines.

Dated 30th September.

2238. J. Plants, Berwick, Lancashire—Manufacture of textile fabrics.
2240. J. Taylor, Princes square—Preparation of skins.

APPLICATIONS WITH COMPLETE SPECIFICATIONS FILED.

2230. H. J. Iliffe, J. Newman, and H. Jenkins, Birmingham—Buttons. (29th Sept.)
2241. C. Bloomer, Goldshill, West Bromwich, Staffordshire—Anchors. (1st Oct.)

WEEKLY LIST OF PATENTS SEALED.

Sealed 6th October, 1853.

825. Henry Leachman, of Compton-terrace, Islington — Improvements in the manufacture of iron. (A communication.)
847. George Humphrey, of Brighton—Invention of an improved self-acting safety-valve, for locomotive, marine, and other steam-boilers.
854. Stephen Taylor, of New York—Improved machinery for weaving seamless goods. (A communication.)
864. William Urquhart, of Great Queen-street—Improvements in the manufacture of printers' types and other articles used in letter-press printing.
865. William Russell Palmer, of Elizabeth City, North Carolina—Improvements in the construction and arrangement of machines for the application of horse-power, which he designates as "Palmer's Improved Horse-power."
866. William Russell Palmer, of Elizabeth City, North Carolina—Improvements in machines for threshing seeds and grains, and for cleaning them from the straw and chaff after they are threshed, which he designates as "Palmer's American Seed and Grain Thresher and Winnower."
869. Donald Nicoll, of Regent-street—Improvements in garments, and in sewing or uniting the seams of the same.
870. Samuel Russell and Robert Murray McTurk, of Sheffield—Improvements in metallic handles for table cutlery, daggers and such-like instruments.
875. James Taylor, of Carlisle, Isaac Brown, of the same place, and John Brown, of Oxford-street—Improvements in the manufacture or production of charred peat.
881. Robert John Kaye, of Bury, and John Ormrod Openshaw, of Roach Mount, near Bury—Improvements in obtaining motive-power by electro-magnetism.
895. Charles Clifford, of Inner Temple-lane—Improvements in apparatus for lowering boats evenly, and preventing their filling with water.
902. John Bethell, of Parliament-street—Improvements in the manufacture of flax.
924. Jean Marie Souchon, of Paris—Improvements in the manufacture and purification of gas for illumination, and certain products therefrom, and in apparatus for that purpose.
931. Richard Ford Sturges, of Birmingham—Improved apparatus for making vegetable and other infusions and solutions.
932. Joel Watts, of Dover Cottage, Sleaford street, Battersea-fields—Improvements in the construction of pistons of steam and other engines; applicable also to force-pumps and lifting-pumps.
938. François George Sicardo, of Marseilles—Invention of a new rotary steam-engine.
955. Richard Archibald Brooman, of Fleet-street—Improvements in reaping and gathering-machinery. (A communication.)
963. James Petrie, of Rochdale—Certain improvements in steam-engines.
1159. Henry Potter Burt, of Charlotte-row—Improvements in portable houses.
1236. Edward Briggs, of the Castleton Mills, near Rochdale—Improvements in the manufacture of pile fabrics, and in the machinery or apparatus employed therein.
1613. Thomas William Kennard, of Duke-street, Adelphi—Improvements in iron bridges.
1748. Warren De la Rue, of Bunhill-row—Invention of a means of treating and preparing certain tar or naphtha, and applying products thereof.
1753. John Dawson, of Linlithgow, Scotland—Invention of a new instrument or apparatus for the purpose of preventing fraud in drawing off liquids.
1759. Farnham Maxwell Lyte, of Florian, Torquay—Improvements in obtaining iodide of potassium when treating certain metals.
1791. Philipp Schäfer and Frederick Schäfer, of Brewer-street—Improvements in travelling-bags.
1795. Augustus Russell Pope, of Massachusetts, America—Invention of a new and useful or improved electro-magnetic alarm apparatus, to be applied to a door or window, or both, of a dwelling-house or other building, for the purpose of giving an alarm in case of an attempt to open said door or window.
1797. Charles May, of Great George-street, Westminster—Improvements in the manufacture of bricks.
1798. Richard Holme, of Kingston-upon-Hull—Improvements in the manufacture of gas.
1824. Richard Brown Roden, of Abersycham Iron-works, near Newport, Monmouthshire — Improvements in rolling iron and all other malleable metals and alloys.
1827. George Frederick Wilson, of Belmont, Vauxhall, and Alexander Isaac Austen, of Trinity place, Wandsworth-road—Improvements in the apparatus used in the manufacture of mould candles.
1838. John Hughes, of Great George-street—Improvements in building or forming structures under water, or below the surface of the ground.
1839. John Martin, of High-street, Marylebone—Invention of an improved shade for gas-burners or lamps.
1849. Moses Poole, of Avenue-road, Regent's-park—Improvements in regulating the flow and pressure of gas and other fluids. (A communication.)
1858. James Burden, of Stirling—Invention of an improved cock or tap.
1873. John Dearman Dunnicliff, of Hyson-green, Nottingham, and John Woodhouse Bagley, of Radford—Improvements in the manufacture of lace fabrics.
1908. Alexander Dalgety, of Deptford—Improvements in rotatory steam-engines.

WEEKLY LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

Date of Registration.	No. in the Register.	Title.	Proprietor's Name.	Address.
Oct. 6	3519	Lamp Candlestick	Felix Lieven Banwens	Candle-works, Ranelagh-road, Pimlico.